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Proceedings of the Maritimes Regional Advisory Process on the Assessments of Scotia–Fundy Groundfish Stocks

23 October 2006
Yarmouth, NS

and

16 – 17 November 2006
Dartmouth, NS

P. Boudreau and R. O'Boyle
Meeting Chairpersons

Compte rendu des réunions du Processus consultatif des provinces Maritimes au sujet des stocks de poisson de fond de Scotia-Fundy

Le 23 octobre 2006
Yarmouth (N.-É.)

et

les 16 et 17 novembre 2006
Dartmouth (N.-É.)

Réunions présidées par
P. Boudreau et R. O'Boyle

Fisheries and Oceans Canada / Pêches et Océans Canada
Bedford Institute of Oceanography / Institute océanographique de Bedford
Dartmouth, NS / Dartmouth, N.-É.
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Foreword

The purpose of these proceedings is to archive the activities and discussions of the meeting, including research recommendations, uncertainties, and to provide a place to formally archive official minority opinions. As such, interpretations and opinions presented in this report may be factually incorrect or mis-leading, but are included to record as faithfully as possible what transpired at the meeting. No statements are to be taken as reflecting the consensus of the meeting unless they are clearly identified as such. Moreover, additional information and further review may result in a change of decision where tentative agreement had been reached.

Avant-propos

Le présent compte rendu fait état des activités et des discussions qui ont eu lieu à la réunion, notamment en ce qui concerne les recommandations de recherche et les incertitudes; il sert aussi à consigner en bonne et due forme les opinions minoritaires officielles. Les interprétations et opinions qui y sont présentées peuvent être incorrectes sur le plan des faits ou trompeuses, mais elles sont intégrées au document pour que celui-ci reflète le plus fidèlement possible ce qui s'est dit à la réunion. Aucune déclaration ne doit être considérée comme une expression du consensus des participants, sauf s'il est clairement indiqué qu'elle l'est effectivement. En outre, des renseignements supplémentaires et un plus ample examen peuvent avoir pour effet de modifier une décision qui avait fait l'objet d'un accord préliminaire.

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ABSTRACT

The Maritimes Regional Advisory Process (RAP) review of the assessments of 4X/5Y cod and haddock and 4VWX5Zc pollock were undertaken in two meetings: data inputs (23 October 2006, Yarmouth, NS) and assessment peer review and drafting of advice (16 – 17 November 2006, Dartmouth, NS). The results of these assessments will be used to inform the management of the 2007/08 fishery of these resources.

RÉSUMÉ

L'examen des évaluations des stocks de morue et d'aiglefin de 4X/5Y ainsi que de goberge de 4VWX5Zc effectué dans le cadre du Processus de consultation régional (PCR) des provinces Maritimes a pris la forme de deux réunions, l'une portant sur les données d'entrée (le 23 octobre 2006, à Yarmouth, N.-É.) et l'autre sur l'examen par les pairs de l'évaluation et la formulation des avis (les 16 et 17 novembre 2006, à Dartmouth, N.-É.). Les résultats de ces évaluations serviront à éclairer la gestion de la pêche de ces ressources en 2007-2008.

INTRODUCTION

Each fall, the DFO Maritimes Science Branch reviews the status of Scotia-Fundy groundfish stocks. As in 2005, the 2006 review was split into two sessions – review of data inputs (23 October 2006) and scientific peer review, interpretation of the information and drafting of the Science Advisory Report (SAR) (16–17 November 2006). The intention of having two meetings is to (1) strengthen the data input review aspect of the RAP process, and especially the Industry's participation, and (2) ensure that the scientific peer review meeting focuses on peer review and interpretation of the information. The data input review is scheduled well in advance of the scientific peer review to allow time for incorporation of feedback into the preparation of the assessment documents. The final goal of the two sessions is to develop stock status conclusions and advice, and complete the Science Advisory Reports (SARs).

As indicated in the terms of reference (Appendix 1), the 2006 review focused on the assessments of 4X/5Y cod and haddock and 4VWX5Zc pollock, specifically:

4X/5Y Cod

- Evaluate whether the latest fisheries and research survey trends indicate any reason to change the advice for this stock for the 2007/08 fishery.

4X/5Y Haddock

- Evaluate whether the latest fisheries and research survey trends indicate any reason to change the advice for this stock for the 2007/08 fishery.

4VWX5Zc Pollock

- Examine available data from various sources (e.g., surveys, commercial fishery and at-sea observer) for consistency with model predictions on population structure and Industry observations, and recommend requirements for new information, monitoring or improved data collection.

- Update the advice using framework methodologies and the latest information from fisheries and research surveys.

The lists of participants (Appendix 2) and agendas of the two meetings (Appendix 3) are provided at the end of this proceedings document.

These proceedings were adopted by correspondence subsequent to the meetings.

DATA INPUTS
Rodd Grand Hotel, Yarmouth, NS
23 October 2006

The meeting commenced with the chair, P. Boudreau, welcoming the participants. The overall process and terms of reference were then presented. The agenda was briefly reviewed.

The chair took his own notes for these proceedings.

The meeting then commenced.

Overview of Oceanographic Conditions

Presentation Highlights / D. Brickman

A summary of the 2006 environmental conditions on the Scotian Shelf (SS), eastern Gulf of Maine (GoM) and Bay of Fundy (BoF) was compiled using available data (up to September). Notable was the absence of research vessel survey nutrient data, a useful element of the environmental review. Conditions were discussed in the context of the large scale climate forcing that influences our region.

In general, the environmental data presented indicated no dramatic changes/trends in our region relative to the expected climatology. Specifically:

1. Air temperature conditions have shown positive anomalies in every month of 2006 (so far).
2. Sable Island wind stress has been normal with a possibility of winter and spring winds being more southerly. This shift seems to be consistent with recent trends.
3. The Ice extent was slightly less than normal in 2006, carrying on an approximate 10-year trend of reduced ice coverage (NB 2003 when it was much greater than average) comment; not clear about meaning of text in parentheses.
4. July ocean surface temperature was above normal everywhere on the Scotian Shelf (SS) and was approximately +2 degrees warmer on eastern and central SS. The temperature was slightly was below normal in the Gulf of Maine.
5. In 2006, near-bottom temperatures were generally warmer than normal on the central Scotian Shelf and Browns Bank.
6. The character of the spring bloom was typical.

Discussion

There was little discussion on the presentation.

4X/5Y Haddock

Presentation Highlights / P. Hurley

Haddock biomass in 4X/5Y from the Research Vessel (RV) and Individual Transferable Quota (ITQ) surveys decreased in the last 2-3 years from high levels in the late 1990s / early 2000s. Biomass is near the long-term average on the Scotian Shelf, but below the long-term average in the Bay of Fundy. Recent recruitment has been good; the 1998, 1999, 2000, and 2003 yearclasses are all above average. Relative fishing mortality has been low. Growth rate has decreased and size at age is small. The population is dominated by small fish. Small fish are being landed.

Discussion

Size at Age:

In response to a question regarding changes in the age at maturity, it was reported that recent data indicate age at maturity for 4X/5Y haddock remains at about ages 3-4. It was pointed out that, despite the reduction in size at age and size at maturity, reproductive potential seemed not to have been adversely affected as recent recruitment has been good.

Concern was expressed regarding the cause of the reduction in growth rate. There was no explanation for the trend in growth rate, but it was noted that this is a broad pattern across haddock stocks in Atlantic Canada, including Georges Bank, and a similar pattern is also seen in many of the cod stocks, although not in 4X/5Y cod.

Fishing Strategy:

Industry questioned why they should not be trying to catch these small fish especially since Age 7 fish are only 43cm on average and with M=0.2, they were losing yield by leaving them in the water. It was pointed out that the data, as presented, indicated that they were at times catching large numbers of haddock less than 43cm in recent years. A yield per recruit analysis conducted last year indicated that, under the current growth regime, there would be no increase in yield by delaying the harvest of this resource to older ages, however, it had also indicated that the harvesting of small fish would have implications to future spawning stock biomass and other aspects of production.

Conclusions:

Members of the fishing industry were generally in agreement with the haddock data presented by Science.

4X/5Y Cod

Presentation Highlights / D. Clark

Despite the low landings in recent years (4,000 - 5,000 t), there has been no increase in biomass for 4X cod. Survey catches indicate 4X cod biomass continues to decline. Mortality estimates also show no indication of decline, despite the low landings. Recent surveys indicate that the 2003 yearclass may be about average, but other cohorts contributing to the fishery are all low. The last promising yearclass was the 1998 yearclass; however, this yearclass depleted quite rapidly, and by Age 7 in 2005, made little contribution to the fishery, and was not caught in the survey in 2006. The recruiting 2004 yearclasss is below average in the surveys.

Discussion

Resource Status:

Industry noted recent increases in both survey total mortality and relative F, and wondered how this could be given that fishing effort had declined over the same period. Possible explanations were that the fishery had become more efficient, or that there was additional mortality not related to fishing. Given that there is no evidence for increased fishing efficiency, sources of natural mortality such as disease and parasites may be playing a more important role as the cod

population declines. It was noted that for other cod stocks (e.g. 4VsW), declines in abundance not related to fishing have been observed.

Distribution and Abundance:

Industry reported very few cod inshore, which is consistent with the decline of the inshore fishery seen in recent years. There was speculation that this may represent the loss of the inshore spawning component for this stock. However, there were reports of many small (15 – 20 cm) cod being seen in Shelbourne Harbour. This is interesting and it was requested that a few specimens be collected and forwarded to D. Clark (SABS). Industry noted that cod offshore are observed at greater depths and that this might be related to the abundance of seals, or the availability of cod prey such as herring.

ITQ Survey:

Industry noted that in 2006 the ITQ survey caught almost no cod, while commercial vessels fishing nearby had very high catch rates. There was speculation that the timing of the survey sets may be affecting catch rates, and that stage of the tidal cycle may have a significant effect. It was noted that coverage in the ITQ survey was good, and that the entire population should be sampled even if there was movement related to tides.

Conclusions:

Members of the fishing industry were generally in agreement with the cod data presented by Science.

4VWX5Zc Pollock

Presentation Highlights / H. Stone

DFO Science reported that the area-weighted fishery catch per unit effort (CPUE) in 2006 for the western stock component was at the second lowest level in the time series and that catch rates were likely constrained by reduced quotas and changes in fishing practices. In contrast, the summer survey biomass index was at the highest observed level in the time series and the abundance of several age groups appear to be at record high levels (strong year affect). Fishery weights at age have generally been decreasing since 1984, but may be levelling off now. The area occupied by the resource in the Western Component has not declined as rapidly over the past two decades as the Eastern Component.

Discussion

Resource Status:

Industry's perception of the current status of the pollock resource is completely different from that presented in the last assessment. Industry noted that all groups were seeing abundant signs of pollock throughout the stock area, despite the fact almost all fishermen were trying to avoid this species due to the low quota. On the eastern Scotian Shelf, pollock fishing was reported to be the best in a decade. Longline catch rates were also reported to be exceptional, which is unusual for this gear. Further, small pollock are being caught by mackerel fishermen and in lobster traps, places where they have not been seen before. It was noted that the most recent data point in the July RV survey supports the Industry view that abundance is high.

CPUE Series:

The usefulness of the commercial catch rate as an index of abundance was questioned. Under the current quota restrictions most fishermen are avoiding pollock as much as possible, and it was noted that current catch rates would not be comparable to those seen earlier in the time series. In addition, sample size will likely be very small, since very few trips would now meet the rule of 50% of the catch being pollock (there was speculation that perhaps only a single vessel might meet the criteria). It was also noted that the method for selecting trips for the catch rate series based on "experience" was flawed, as "experience" is related to the Captain of the vessel, not the vessel itself.

The question was raised as to how to proceed with the population analysis given these CPUE issues. Possible avenues include re-analysis of the catch rate series, dropping experience and or adjusting the 50% rule, as well as exploring different Virtual Population Analysis (VPA) formulations. However, it was noted that there are time constraints with the RAP meeting scheduled for 16 November 2006. Further, the implications of straying from the benchmark assessment template were unclear.

Sampling:

Sampling of the catch was described as adequate, but at lower levels than that seen in the past. As the pollock fishery becomes smaller, calculating the catch at age accurately may be more difficult. In examining the age structure of the commercial catch, a truncation of older ages was seen for recent years. The possibility was raised that this pattern might be a sampling artefact and it was suggested that this be investigated. Several Industry members questioned the distribution of sampling by gear type, commenting that they could not recall having their catch sampled in recent years. Given the fact that DFO Science port sampling resources are very restricted, Industry sampling was raised as a possible activity which would improve this situation.

Georges Bank:

Industry pointed out that the management unit for this resource includes 5Z, but this is not addressed in the assessment. Earlier, when the benchmark assessment formulation was derived, the 5Z component was thought to be insignificant. However, in recent years the Georges Bank component has been high, and the question was raised as to whether this could invalidate the results of the assessment. It was noted that while the July RV survey does not sample 5Z, landings and CPUE from this area are included in the assessment. The possibility of extending coverage of the July RV survey to the Canadian portion of Georges Bank was raised. This additional coverage would likely be of benefit, especially if the proportion of the resource in 5Z was changing. Another possibility is that the pollock resource could be addressed as a transboundary stock through the Transboundary Resource Assessment Committee (TRAC) process.

Conclusions:

The poor status of the pollock resource as described by the 2005 assessment is completely inconsistent with the perception of Industry. Serious issues have been identified for the CPUE time series used as a tuning index in the benchmark formulation, as well as possible deficiencies in survey coverage and sampling of the commercial catch.

General Discussion

There was a general discussion on the state of the pollock stock and the difference between the RV survey results and the CPUE data. Industry suggested that the CPUE data for 2006 is reflecting the low TAC and that it does not adequately reflect the state of the stock. The data from the Standardized Catch Rate Analyses was challenged. Due to the low TAC and the catches of pollock in non-directed fisheries, there was only a very minimal directed fisheries for pollock in 2006 and this might be impacting on the data.

Closing Remarks

The members of the fishing industry thanked DFO Science for having these sessions and they appreciated the chance to comment on the data inputs in advance of the stock assessment session. They expressed a desire to see better representation of their comments in this year's assessment. The Chairman thanked all of the participants for their participation and their constructive review.

PEER REVIEW AND REPORT DRAFTING
Bedford Institute of Oceanography, Dartmouth, NS
16–17 November 2006

The meeting commenced with the chair, R. O'Boyle, welcoming the participants. After around the table introductions, the Regional Advisory Process (RAP) for fall groundfish assessments in Scotia-Fundy was described and the Terms of Reference (ToR) reviewed, which was followed by a review of the meeting agenda. The meeting rapporteurs (S. Armsworthy for pollock, M. Showell for cod, and K. Smedbol for haddock) were introduced, after which the meeting commenced.

4VWX5Zc Pollock

Stone, H.H., P.Perley, and D. Clark. 2006. Assessment of Pollock in 4VWX and 5Zc. RAP Working Paper 2006/01

Presentation Highlights / H. Stone

Landings of pollock in the 4VWX5Zc fishery in 2006/07 are 2,651t as of 3 November 2006, against a quota of 4,500t. An assessment was completed using input data through the second trimester of 2006. Recent catch rates (i.e. 2005 and 2006) are not comparable to those observed earlier in the time series because of management restrictions. The mobile gear catch rate series is now at the second lowest level in the 24-year time series. The current trend is inconsistent with other indicators. The 2006 RV biomass index was at the highest observed level in the time series for the Western Component, and although this was an obvious year effect, there has been a general increasing trend since 2003. Other surveys (ITQ, NMFS Spring, NMFS Fall) indicate a general trend of increasing rather than decreasing abundance for pollock and support recent trends from the DFO survey. Declining fishery weights at age do not reflect the population trend from the survey and are likely influenced by changes in fishing patterns. Using a Modified Base VPA which excludes 2005 and 2006 from the catch rate index (because of quota restrictions), 4+ biomass has increased from a low of about 8,000t in 2000 to 30,000t in 2006. The 2001 yearclass is estimated at nearly 15 million recruits (exceeding 1999 yearclass and is the second highest since 1980). Indications for 2002 and 2003 yearclasses are that they are weaker (5 million recruits). Reduced quotas and harvests have contributed to a decline in fishing mortality rates for older fish (ages 6-9) which declined to a level just below F_{ref} in 2006. The range of harvest strategies in the 2007/2008 fishing year that are risk averse (25% risk of exceeding F_{ref}) to risk neutral (50% risk of exceeding F_{ref}), are about 4,400t to 5,300t.

Discussion

Fishery and Catch Rates

For quota allocation, fisheries management separates the Eastern and Western components at the 4X/4W line, which is a different geographic split than that used by Science. Industry commented that they are seeing lots of pollock in 4W and that the low quota in this component results in more pressure on the Western Component. The low TAC in the west has greatly changed the behaviour of the fleet so that recent catch rate information for this component is no longer meaningful.

Fishermen expressed concern over the definition of a "pollock directed trip" used by Science for catch rate analyses (i.e. pollock has to represent > 50% of total catch to be included in the

analyses). A scenario was presented where two days of fishing are spent directing for haddock and the third and final day is spent directing for pollock. When the data is aggregated to the trip level, it looks like more effort was spent on pollock than actually occurred. If CPUE was calculated on a set by set basis, this problem could be circumvented. It was noted that set by set information is only available back to 2002 on MARFIS, but prior to this subtrips are used in the Catch/Effort database, which are not the same as individual sets. This creates problems with comparability, and there may not be an easy way to resolve this issue.

DFO Survey

It was noted that while the DFO summer survey biomass trends are highly variable, this series should be included as a tuning index, particularly when the current catch rates for the commercial fishery are no longer proportional to trends in abundance. Pollock, being a semi-pelagic schooling species is not as well sampled in the RV survey as other gadids and this creates high variability in the abundance index from year to year. Industry's main concern with the survey series was that it currently does not cover the Canadian portion of Georges Bank, which has become increasingly important to the fishery in recent years.

Weights at Age

The fishery weights at age, which are used as a proxy for population weights at age for ages 5+, have been decreasing since about 1984. In contrast, the survey weights at age for these age groups do not show this same declining trend, indicating that the fishery weights may be influenced by changes in fishing patterns. The selection of weights at age is influential in population biomass estimates and recent trends may have an impact on the calculations of biomass trends and reference points. Using survey weights at age could result in a greater proportional increase in biomass since 2000; therefore, an investigation of their influence should be conducted.

Eastern Component

For the Eastern Component, the RV survey is not showing any increase in biomass (currently it is at the third lowest level since 1970) and therefore, the recommendation is the same as last year - no directed fishery until the Eastern Component recovers. Sampling of catches in the Eastern Component is minimal at present and it was recommended that Industry try to obtain samples of catches east of Shelburne. Concern was expressed over the possible loss of spawning components in the central and eastern Scotian Shelf which in past decades was an important part of the fishery. It was noted that harbour pollock no longer seem to be present in Chedabucto Bay. It was suggested that a larval survey should be conducted during the spawning season (November-January) to determine if there is any contribution to the population from this area.

Research Recommendations

- Get Industry to obtain commercial fishery samples from the Eastern Component.
- Set up meetings with members of the fishing industry to discuss the effect of various fishing activities on commercial catch rate indices, and conduct additional exploratory analyses on this series.
- Conduct a thorough investigation of the weights at age for both the survey and the fishery and determine their implication on biomass estimates.
- Conduct a larval survey on the spawning grounds during the November-January spawning period to provide an indication of the spawning component in the east.

4X/5Y Cod

Clark, D.S., and P. Perley. 2006. Assessment of Cod in Division 4X in 2006. RAP Working Paper 2006/02.

Presentation Highlights / D. Clark

Despite the low landings in recent years, survey catches indicate there has been no increase in biomass for 4X cod; instead, there has been some decline in biomass. Mortality estimates also show no indication of decline. In addition, survey recruitment estimates are low for the 2004 yearclass. Landings of about 4,000 t, as reported for 2005, and anticipated for 2006, do not appear to be sustainable for this resource at present. The illustrative VPA results are consistent with these conclusions from survey and fishery data.

While landings of about 4,000t are contributing to a continuing decline in abundance, further restriction of the directed fishery may not be sufficient to lead to an increase in population. Removals from all fisheries should be reduced to as low a level as practicable.

Discussion

Regarding population structure, discussion centered on tagging results, noting the potential for mixing with other adjacent cod stocks. Analysis of recent tag return data in 4X shows little movement, with returns of around 15%. It was suggested that tagging data might provide independent estimates of total mortality rates. A preliminary analysis showed total mortality to be high, similar to that seen from the RV survey and the VPA estimates. It would be useful to include analysis of this nature in future assessments. Tagging of cod on Georges Bank showed that while younger fish tended not to move, there was some movement of older fish to 4X. This contributes uncertainty in the catch at age for fish caught in 4Xp.

Large catches from the 1960s were noted, primarily from foreign and large vessel OTB fleets fishing in 4Xmno. Recently landings from 4Xp have shown an increasing trend, particularly from the top of Browns Bank. Large quantities of sand lance are reported from this area by Industry, perhaps the most seen in recent times. The 4X cod quota has not been landed for the past two years, suggesting the TAC is not restrictive. However, Industry noted this did not reflect the true situation. Recent low cod TACs have resulted in the quotas being restrictive on an individual vessel basis, although they may not appear so in aggregate. Concern was expressed that given restrictive cod quotas on Georges Bank, fish from this area may be misreported as caught in 4X, and this may be affecting the assessment results. This was acknowledged as a potential problem, but was thought to be an improvement over the situation in 2001/2002.

Sampling for catch at age was described as adequate, although coverage of the fixed gear sector could be improved, particularly with regard to otolith collection.

A lack of 2 year old fish in recent years was noted. This was thought to be a result of gear changes, as well as changes in the timing of the fishery.

Trends in abundance are down for the RV survey, in both the Bay of Fundy and on the Scotian Shelf. This is difficult to reconcile with the increase in catchability since 1993 seen (later) in the VPA. This may be related to changes in distribution, with more of the resource now present in the area sampled by the RV survey, rather than inshore. It was suggested that the relative weighting of the RV and ITQ surveys might be contributing to this, but this was dismissed, as

the effect extended to the converged portion of the VPA. Recent recruitment is thought to be poor, although it was noted that estimates of abundance for ages 0 and 1 are not reliable. The ITQ survey shows similar trends to the RV for the Bay of Fundy, with recent indices poor. On the Scotian Shelf the ITQ indices showed less of a decline than the RV.

Estimates of total mortality (Z) from the RV survey are high, with some recent increase for both the Bay of Fundy and Scotian Shelf. Z on ages 4-7 need not be adjusted for catchability, as they are fully recruited. The question was raised as to how much of the total mortality could not be accounted for. There is no clear answer, as this might be related to fishing mortality, survey catchability, or natural mortality. The increase required to account for m in a traditional VPA would be approximately 0.8, which is likely too high to be possible. Further, this would not explain the increase in Z on older fish, as seals are expected to eat smaller fish. Unreported bycatches from other fisheries may also be important.

Industry noted that several fisheries in 4X catch cod as a bycatch, particularly the lobster and scallop fisheries. The magnitude of these bycatches is not clear, as there is very little observer coverage on these fleets. However, at the current low resource level for cod, even small catches may be limiting rebuilding and/or reducing recruitment. Further, bycatches of this nature may be increasing, as scallop activity has recently increased on Browns Bank and the lobster fishery is now conducted more offshore with larger rings on the traps. It was thought that a sensitivity analysis examining how bycatch behaviour over time might be affecting VPA results would be useful. A consistent approach by DFO on bycatch is seen as a key step by Industry, as it is important that these issues be taken into account when management strategies are considered. Work in this area is now underway, but results will not be available in the near future. It was **recommended** that, for the next assessment, the results of the planned DFO bycatch workshop be reviewed and bycatch estimates be used to develop estimates of fishing mortality if possible.

4X/5Y Haddock

Hurley, P.C.F., G.A.P. Black, G.A. Young, P.A. Comeau, and R.K. Mohn. 2006. Assessment of the Status of Division 4X/5Y Haddock in 2006. RAP Working Paper 2006/03.

Presentation Highlights / P. Hurley

Landings of 4X/5Y haddock in the fishing year ending 31 March 2006, were 5,141t relative to a quota of 8,000t. Following recommendations from Industry, the quota in the 2006/07 fishing year was reduced to 7,000t. Industry indicated there are a number of reasons the haddock quota has not been taken in recent years. Spawning stock biomass (ages 4+) from the RV and ITQ surveys increased over the past decade and then decreased in the last 2-3 years, but it is still above the long-term average on the Scotian Shelf. In the Bay of Fundy, spawning stock biomass is below the long-term average. Recent recruitment has been good; the 1998, 1999, and 2000 yearclasses are all strong, and the 2003 yearclass is moderate. Growth rate has decreased and size at age is small. The population is dominated by small fish, and small fish are being landed. There is no indication from sampling that discarding of small fish is occurring. The recruitment indices, age structure, and relative fishing mortality for the Scotian Shelf suggest that exploitation is low and is allowing rebuilding of the age structure and population abundance. On the other hand, these indicators suggest that exploitation in the Bay of Fundy may be too high and is hampering rebuilding and expansion of the age structure of the population in this area.

Discussion

Some discussion ensued concerning the fishery patterns in time and space during the last quota year. It was noted that there was a relatively small increase in effort around Browns Bank, and a minor decrease in effort in the Bay of Fundy. There was also an increase in landings caught from the area off Lunenburg. In total, the participants felt that fishery patterns have not changed substantially. The one exception was a substantial increase in landings from the <45ft fixed gear sector.

An expanded age range was evident in the commercial catch-at-age data. The consensus interpretation of this expansion was that exploitation does not appear to be outpacing recruitment. However, a review of landings information indicated that fish <43cm comprised an increased proportion of the total landings compared to the previous fishery year.

Despite the decline in growth rates over the last decade, age at 50% maturity remains at Age 3. As a result, length at maturity has decreased concomitantly.

In the discussion of last year's VPA population projections, it was noted that the partial recruitment value used for Age 5 fish may have been too low. This supposition was supported by a review of the commercial catch-at-age data, which indicated that more Age 5 fish were landed than the catch predicted by the population model. Overall though, meeting participants agreed that no alarming signals or discrepancies were evident from the comparison of predicted and realized catch.

Review of the research vessel index lead to discussion of spatial and temporal patterns. In general the consensus interpretation of the data was that recovery in abundance may be greater on the Scotian Shelf than in the Bay of Fundy.

Closing Remarks

After review of the draft Science Advisory Reports, the chair noted that there would be a DFO internal Editorial Board review the week following the meeting to ensure quality readership and conformation with CSAS report guidelines. The chair then thanked the participants and adjourned the meeting.

APPENDICES

Appendix 1. Terms of Reference.

Context

Each fall, the DFO Maritimes Science Branch reviews the status of various Scotia-Fundy groundfish stocks. The 2006 RAP fall review will be split into two RAP sessions – review of data inputs (23 October 2006) and scientific peer review and interpretation of the information and Science Advisory Report (SAR) drafting (16-17 Noaember 2006). The focus of the 2006 groundfish RAP will be on the resources indicated below.

The intention of having two meetings is to (1) strengthen the Data Input review aspect of the RAP process, and especially the Industry's role in the research agenda regarding the approach to data sourcing and collection; and (2) ensure that the RAP Scientific Peer Review meeting concentrates on the scientific peer review and interpretation of the information. The Data Input review is about 4 weeks before the Scientific Peer review; late enough to allow time to have the data inputs ready, but early enough so there is sufficient time before the Peer Review meeting to incorporate the feedback from the Data Input meetings and to prepare the complete assessment document. The final goal of the two RAP sessions is to develop stock status conclusions and advice, and complete the Science Advisory Reports (SARs).

Presentation and discussion of data inputs to the assessments will occur at the RAP Data Input Review Meetings (23 October 2006, Yarmouth, Nova Scotia). Presentation and discussion of the outcome from this first meeting, the subsequent analyses conducted, and the formulation of the "Conclusions and Advice" portion of each SAR will occur during the RAP Scientific Peer Review Meeting (16-17 November 2006, Dartmouth, Nova Scotia).

Objectives

The following issues will be addressed for each stock in order to develop scientific consensus through peer review:

4X/5Y Cod

- Evaluate whether the latest fisheries and research survey trends indicate any reason to change the advice for this stock for the 2007/08 fishery.

4X/5Y Haddock

- Evaluate whether the latest fisheries and research survey trends indicate any reason to change the advice for this stock for the 2007/08 fishery.

4VWX5Zc Pollock

- Examine available data from various sources (e.g., surveys, commercial fishery, and at-sea observer) for consistency with model predictions on population structure and Industry observations, and recommend requirements for new information, monitoring or improved data collection.

- Update the advice using framework methodologies and the latest information from fisheries and research surveys.

Products

CSAS Science Advisory Stock Assessment Report (SAR) for each resource
CSAS Proceedings summarizing the discussion
CSAS Research documents for each resource

Participation

Participation at the RAP meeting will be solicited from the following:

- DFO Science & Fisheries Management
- FRCC
- Industry

Appendix 2. List of Participants

DATA INPUTS: Yarmouth, NS, 23 October 2006

Name	Affiliation	Fax	Email Address
Boudreau, Paul R. (Chair)	DFO, Science	(902) 426-5435	boudreaupr@dfo-mpo.gc.ca
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PEER REVIEW AND REPORT DRAFTING: Dartmouth, NS, 16–17 November 2006

[1] If you require a hard copy of the proceedings, please provide a full mailing address. All others will receive an electronic copy of the proceedings by email.

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Appendix 3. Agendas

DATA INPUTS: Yarmouth, NS, 23 October 2006

14:00 Introduction

Overview of oceanographic conditions

For each of pollock, cod and haddock
- Description of the fishery
- Sampling and catch-at-age
- Abundance indices
- Questions of clarification

General discussion

17:00 Close

PEER REVIEW AND REPORT DRAFTING: Dartmouth, NS, 16–17 November 2006

16 November 2006 - Thursday

0930 - 1000 Welcome and Introduction (O'Boyle)

1000 - 1200 4VWX5Zc Pollock (Stone)

1200 - 1300 Lunch

1300 - 1500 4X Cod (Clark)

1500 - 1700 4X / 5Y Haddock (Hurley)

17 November – Friday

0830 - 1200 Report Review

1200 - 1300 Lunch

1300 - 1600 Report Review

1600 Adjournment